

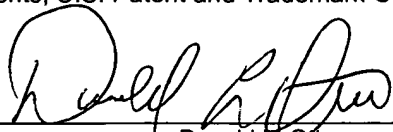


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12 Appellants
brief
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Date: November 13, 2002


Donald E. Otto

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket CUTLP0101USA

In re PATENT application of

Stephen Cutler et al

Serial No. 09/827,048

Filed April 5, 2001

For: ELECTRICAL CONNECTOR WITH IMPROVED LOCKING MEANS

Confirmation No. 4511

Art Unit 2833

Alexander Gilman, Examiner

APPELLANTS' BRIEF

Commissioner for Patents
U.S. Patent and Trademark Office
Washington, DC 20231

Sir:

This is an appeal from the decision of the Examiner mailed July 30, 2002 finally rejecting claims 33-39, 42, 44 and 48-50. An Appendix containing a copy of the claims on appeal is attached hereto.

1. REAL PARTY IN INTEREST

The real parties in interest are Stephen Cutler and Sue Ellen Cutler, each of whom has a 50% undivided interest in and to the above application.

2. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences which directly affect or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

Claims 33-40, 42, 44 and 47-50 are pending in the application. Of these claims, claims 40 and 47 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The appeal is taken on pending claims 33-39, 42, 44 and 48-50.

4. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection mailed July 30, 2002.

5. SUMMARY OF INVENTION

The invention toward which the appealed claims are directed relates to an electrical connector 10 for electrically and mechanically connecting a plurality of wires or other types of electrical conductors in a quick, secure and reliable manner. Fig. 2 shows five electrical wires 14, 16, 18, 20 and 22 joined by electrical connector 10. An electrical connection may also be established between one or more of the wires and an additional conductor 220 which may have a wire terminal connection with the conductive contact component 4 of electrical connector 10 as shown in Fig. 3.

Alternatively, the conductive metal sheet out of which the conductive contact component 4 is stamped or otherwise cut may be stamped or cut to include a conductor 220' as an integral part of the conductive contact component as schematically shown in phantom lines in Fig. 9 and described on page 15, lines 6-12 of the present application.

Conductive contact component 4 has a contact section 104, another section 100 in parallel spaced relation from contact section 104, and an intermediate section 102 that interconnects one end of each of the contact section 104 and other section 100 as schematically shown in Fig. 3. An intumed lip 106 integral with contact section 104 in axial spaced relation from an opening 116 in intermediate section 102 acts as a stop for the exposed conductive wire element 182 of one of the wire conductors 14 when inserted through the opening 116 as further shown in Fig. 3.

One or more spring locking clips 6 and 8 are spring biased to urge the spring arms (for example spring arm 156) to bear against and interengage wire element 182 such that the distal end 186 of the outwardly flexed spring arm, shown in solid lines in Fig. 3, grips the wire and establishes electrical interconnection between the contact component 4 and wire element 182 as described on page 13 of the present application.

The spring arms 156 are shown in Fig. 3 with transversely flat configurations. However, as described on page 11, lines 7-9 of the present application, some embodiments of the spring arms may be transversely curved as shown by the phantom edge 159 in Fig. 14 to conform to the shape of a wire to be contacted.

A plurality of substantially parallel guide ribs 126, 128, 130 and 132 may be formed longitudinally front to back in contact section 104 as shown in Fig. 1. These ribs are transversely offset from the respective openings 116, 118, 122 and 124 in

intermediate section 102 of contact component 4 for locating the wires relative to the spring locking clips 6 and 8. Also one or more release holes 140 may extend through one of the elongate ribs 126 transversely offset from the opening 116 in intermediate section 102 for receiving a clip release element or tool 200, shown in Figs. 16 and 17. To release the spring lock, the tool is manipulated to insert pins 204 through holes 140 in contact component 4 to engage spring arms 156. By continuing to push on tool 200, the pins urge spring arms 156 upwardly to disengage exposed wire element 182, thus permitting the wire to be disengaged from the contact and removed from the enclosure as described in the paragraph bridging pages 13 and 14 of the present application.

6. ISSUES

The following issues are presented for review:

A. Whether claims 33-37, 39, 44 and 48-50 are unpatentable under 35 U.S.C. § 103(a) as being unpatentable over Tozuka et al U.S. Patent 5,454,730 in view of Gelati U.S. Patent 4,768,976.

B. Whether claims 38 and 42 are unpatentable under 35 U.S.C. § 103(a) over Tozuka et al in view of Gelati and further in view of Kubota et al U.S. Patent 4,673,232.

7. GROUPING OF CLAIMS

For the reasons set forth in the argument which follows, not all of the rejected claims as grouped by the Examiner stand or fall together.

8. ARGUMENT

Appellants' contentions with respect to the issues presented for review, and the basis therefor, are set forth below.

A. The rejection of claims 33-37, 39, 44 and 48-50 under 35 U.S.C. § 103(a)

Claims 33-37, 39, 44 and 48-50 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tozuka et al in view of Gelati.

Independent claims 39 and 44 are directed to a locking connector for electrically interconnecting two or more electrical conductors including, *inter alia*, an electrical contact component electrically interengaged with a first conductor. As claimed, the contact component is made of metal sheet material having a contact section, another section in parallel spaced relation from the contact section, an intermediate section that interconnects one end of each of the contact section and such another section, and an opening extending through the intermediate section that receives a second conductor. An inturned lip integral with the contact section in axial spaced relation from the opening in the intermediate section acts as a stop for the second conductor when inserted through the opening in the intermediate section. Also at least one spring locking clip is spring biased to grip the second conductor and hold the second conductor in electrical interengagement with the contact section, while resisting disengagement of the second conductor from the contact section.

Admittedly Tozuka et al discloses a locking connector in Fig. 1 comprising an electrical contact component 21 including a contact section 27, another section 28, and an intermediate section 26 with an opening 25 that receives a second conductor 2. Also Tozuka et al disclose at least one electrically-conductive spring locking clip 22.

However, neither Tozuka et al nor Gelati discloses or suggests the claimed inturned lip integral with the contact section of the electrical contact component in axial

spaced relation from the opening in the intermediate section that acts as a stop for the second conductor when inserted through the opening in the intermediate section. In Tozuka et al, the stop for the conductor 2 is the end of the wall of the holder 11, whereas in Gelati the stop for the conductor 4 is the tapered hole in the cover 2 which is engaged by the insulated portion of the conductor.

The Examiner acknowledges that Tozuka et al when modified by Gelati does not use the claimed inturned lip integral with the contact section that acts as a stop for the second conductor, utilizing for it the holder 11, but contends that the elimination of the inturned lip is an obvious expedient since it has been held that omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. However, what the Examiner is apparently attempting to do is eliminate an element of the claim (i.e., the inturned lip) and its function, which is clearly improper. Moreover, it is respectfully submitted that the claimed inturned lip functions differently as a stop than the holder 11 of Tozuka et al in that the claimed inturned lip locates the entire end portion of the conductor within the contact component whereas the housing 11 of Tozuka et al does not. Where, as here, the differences in the claimed structure give advantageous results not disclosed or suggested in the cited references, more than a matter of design is involved.

Accordingly, claims 39 and 44 are submitted as clearly allowable.

Claims 35 and 36 ultimately depend from claim 39 and claims 33, 34, 37 and 48-50 ultimately depend from claim 44 and are submitted as allowable for substantially the same reasons. Moreover, claims 48 and 49 further patentably distinguish over the cited references, claim 48 by reciting that the first conductor is integral with the contact

component, and claim 49 by reciting that the first conductor has a wire terminal connection with the contact component. Also claim 50 further patentably distinguishes over the cited references by reciting that the contact section includes an elongate rib formed in the contact section transversely offset from the opening in the intermediate section for locating the second conductor relative to the clip, and a release hole extending through the elongate rib transversely offset from the opening for receiving a clip release element.

release hole

The Examiner acknowledges that Tozuka et al does not disclose a first conductor and a release hole formed through the contact section transversely offset from the opening, but contends that it would have been obvious to provide the Tozuka et al device with a first conductor and a release hole formed through the contact section as taught by Gelati. However, it is not seen wherein the first conductor of Gelati is integral with the contact component as recited in claim 48 or has a wire terminal connection with the contact component as recited in claim 49. Moreover, the release hole 12 of Gelati extends through the top of the contact section, and thus there is no suggestion in Gelati or Tozuka et al of providing the Tozuka et al device with a release hole extending through an elongate rib formed in the contact section for locating the second conductor relative to the clip as recited in claim 50. Thus it is submitted that the Examiner has combined these references in light of appellants' present teachings and certainly not from any teachings or suggestions found in the cited references, which is clearly improper. Accordingly, reversal of the Examiner's rejection of claims 33-37, 39, 44 and 48-50 under 35 U.S.C. § 103 is respectfully requested.

B. The rejection of claims 38 and 42 under 35 U.S.C. § 103(a)

Claims 38 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tozuka et al in view of Gelati as applied to claim 39 and further in view of Kubota et al. According to the Examiner, Tozuka et al when modified by Gelati discloses all of the claim limitations except for the grip locking end portion of the spring locking clip, which as claimed, is transversely curved across its entire width to conform to the profile of the second conductor.

For this feature, the Examiner relies on Kubota et al, contending that it would have been obvious to manufacture Gelati's grip locking end portion transversely curved, as taught by Kubota et al, to make the end portion correspond to the configuration of the second conductor. However, the grip locking end portion 1A of Kubota et al is shown in Fig. 1 and described in column 3, lines 11-14 as having a tooth portion to bite the cable, not a grip locking end portion that is transversely curved across the entire width of the grip locking end portion to conform to the profile of the second conductor as recited in claims 38 and 42. This has the advantage of maximizing surface contact between the grip locking end portion and associated conductor, which is not possible when the grip locking end portion is tooth shaped as disclosed in Kubota et al. Thus to modify the grip locking end portion 1A of Kubota et al to make it transversely curved across the entire width of the grip locking end portion to conform to the profile of the associated conductor would be directly contrary to the teachings thereof. Accordingly, reversal of the Examiner's rejection of claims 38 and 42 under 35 U.S.C. § 103(a) is respectfully requested.

9. CONCLUSION

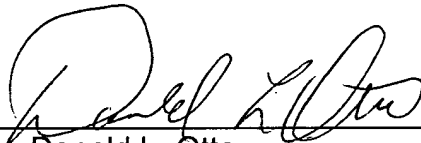
For the reasons set forth above, appellants respectfully request that the rejection of claims 33-39, 42, 44 and 48-50 on appeal be reversed and that such claims be allowed.

The Brief is filed herewith in triplicate, and the Appeal Brief fee of \$160.00 is enclosed herewith.

Please charge any additional fees or credit any overpayment to our Deposit Account No. 18-0988.

Respectfully submitted,

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APPENDIX

33. The connector of claim 44 further including an enclosure that accommodates said contact component, said enclosure having an inlet aligned with said opening for receiving the second conductor.

34. The connector of claim 33 wherein said enclosure includes a unitary component.

35. The connector of claim 39 wherein said contact component has opposite ends, said opening that receives the second conductor extending through one of said ends, and another opening that receives the first conductor extending through the other of said ends, and at least one additional spring locking clip that is spring biased to grip the first conductor and hold the first conductor in electrical interengagement with said contact section, while resisting disengagement of the first conductor from said contact section.

36. The connector of claim 35 further comprising another release hole formed through said contact section transversely offset from said another opening for receiving a clip release element, said additional clip having a portion extending transversely outward of said another opening in line with said another release hole that is engageable by the clip release element upon insertion of the clip release element into said another release hole to urge said additional clip into an open condition to permit unobstructed insertion and removal of the first conductor into and out of said contact component.

37. The connector of claim 44 further comprising an enclosure that includes a generally rectilinear component having an interior space that accommodates said

contact component, said rectilinear component including a front surface having an inlet aligned with said opening for receiving the second conductor, and a rib that peripherally surrounds said rectilinear component and extends transversely to said front surface, said generally rectilinear component including at least one surface that has a recess formed therein which facilitates a user's grip.

38. A locking connector for electrically interconnecting two or more electrical conductors comprising:

an electrical contact component electrically interengaged with a first conductor, said contact component including a contact section and an opening that receives a second conductor;

and

at least one spring locking clip that is spring biased to grip the second conductor and hold the second conductor in electrical interengagement with said contact section, while resisting disengagement of the second conductor from said contact section, said clip having a grip locking end portion that is transversely curved across the entire width of said grip locking end portion to conform to the profile of the second conductor.

39. A locking connector for electrically interconnecting two or more electrical conductors comprising:

an electrical contact component electrically interengaged with a first conductor, said contact component being made of metal sheet material having a contact section, another section in parallel spaced relation from said contact section, an intermediate section that interconnects one end of each of said contact section and said another section, an opening extending through said intermediate section that receives a second

conductor, and an intumed lip integral with said contact section in axial spaced relation from said opening in said intermediate section that acts as a stop for said second conductor when inserted through said opening in said intermediate section;

at least one spring locking clip that is spring biased to grip the second conductor and hold the second conductor in electrical interengagement with said contact section, while resisting disengagement of the second conductor from said contact section;

and

a release hole formed through said contact section transversely offset from said opening for receiving a clip release element, said clip having a portion extending transversely outward of said opening in line with said release hole for engagement by the clip release element upon insertion of the clip release element into the release hole to urge said clip into an open condition to permit unobstructed insertion and removal of the second conductor into and out of said contact component.

42. A locking connector for electrically interconnecting two or more electrical conductors comprising:

an electrical contact component electrically interengaged with a first conductor, said contact component including a contact section and an opening that receives a second conductor;

at least one spring locking clip that is spring biased to grip the second conductor and hold the second conductor in electrical interengagement with said contact section, while resisting disengagement of the second conductor from said contact section, said clip having a grip locking end portion in alignment with said opening that is spring biased to grip the second conductor, said grip locking end portion being transversely

curved across the full width of said grip locking end portion to conform to the profile of the second conductor;

and

a release hole formed through said contact section transversely offset from said opening for receiving a clip release element, said clip having a portion extending transversely outward of said opening in line with said release hole for engagement by the clip release element upon insertion of the clip release element into the release hole to urge said clip into an open condition to permit unobstructed insertion and removal of the second conductor into and out of said contact component.

44. A locking connector for electrically interconnecting two or more electrical conductors comprising:

an electrical contact component electrically interengaged with a first conductor, said contact component being made of metal sheet material having a contact section, another section in parallel spaced relation from said contact section, an intermediate section that interconnects one end of each of said contact section and said another section, an opening extending through said intermediate section that receives a second conductor, and an inturned lip integral with said contact section in axial spaced relation from said opening in said intermediate section that acts as a stop for said second conductor when inserted through said opening in said intermediate section;

and

at least one spring locking clip that is spring biased to grip the second conductor and hold the second conductor in electrical interengagement with said contact section, while resisting disengagement of the second conductor from said contact section.

48. The connector of claim 44 wherein said first conductor is integral with said contact component.

49. The connector of claim 44 wherein said first conductor has a wire terminal connection with said contact component.

50. The connector of claim 44 wherein said contact section includes an elongate rib formed in said contact section transversely offset from said opening for locating the second conductor relative to said clip; and

a release hole extending through said elongate rib transversely offset from said opening for receiving a clip release element, said clip having a portion extending transversely outwardly of said opening in line with said release hole for engagement by the clip release element upon insertion of the clip release element into the release hole to urge said clip into an open condition to permit unobstructed insertion and removal of the second conductor into and out of said contact component.